CLAIMS

1. A manufacturing method for an infrared detection device including a thermal resistance element in which a thermal resistor substance contacts an electrode, the manufacturing method comprising:

an electrode formation step of forming the electrode in a predetermined shape on a substrate; and

a growth step of growing the thermal resistor substance on the electrode.

2. A manufacturing method for an infrared detection device including a thermal resistance element in which a thermal resistor substance whose resistance changes according to temperature contacts an electrode, the manufacturing method comprising:

an electrode formation step of forming the electrode on a semiconductor substrate;

a thin film formation step of forming a thin film on the electrode;

a thin film removal step of removing a portion of the thin film to expose the electrode; and

a growth step of growing the thermal resistor substance on the exposed electrode.

3. The manufacturing method of claim 1 or 2, wherein

the growth step selectively grows the thermal resistor substance on only the electrode by a vapor growth method.

4. The manufacturing method of claim 3, wherein

the vapor growth method is a metal-organic chemical vapor deposition method.

5. The manufacturing method of claim 3, wherein the growth step includes:

a vaporization step of vaporizing a composition material of the thermal resistor substance into a gaseous material;

an ion clusterization step of ion clusterizing the gaseous material;

a collection step of collecting the ion clusterized gaseous material on the electrode by giving the electrode a predetermined electric potential to generate an electric field; and

a condensation step of causing the ion clusterized gaseous material to condense on the electrode by heating the electrode to a predetermined temperature, to grow the thermal resistor substance.

6. The manufacturing method of claim 1 or 2, wherein

the growth step selectively grows the thermal resistor substance by a liquid-phase growth method.

7. The manufacturing method of claim 6, wherein

the liquid-phase growth method is an electrophoresis method.

8. The manufacturing method of claim 6, wherein the growth step includes:

a colloidization step of colloidizing a composition material of the thermal resistor substance into colloid particles;

a suspension generation step of generating a suspension including the colloid particles;

an electric field generation step of, with the semiconductor substrate being immersed in the suspension, applying a predetermined voltage to the electrode to generate an electric field; and

an aggregation step of causing the colloid particles to aggregate on the electrode by an action of the electric field, to grow the thermal resistor substance.

9. The manufacturing method of claim 1 or 2, wherein

a crystal lattice constant of the electrode, along an interface with the thermal resistor substance, is substantially equal to a crystal lattice constant of the thermal resistor substance.

10. The manufacturing method of claim 1 or 2, wherein

a material of the thermal resistor substance is a strongly correlated electron material expressed by a general formula $Pr_xCa_{1-x}MnO_3$, to which a metal oxide, having a perovskite structure that includes an alkaline-earth metal or a rare-earth metal, has been added.

11. The manufacturing method of claim 2, wherein the thin film is an insulation film.

12. The manufacturing method of claim 1 or 2, wherein the thermal resistor substance is a single crystal.

13. An infrared detection device including a thermal resistance element in which a thermal resistor substance whose resistance changes according to temperature contacts an electrode, the infrared detection device being manufactured by a manufacturing method including:

an electrode formation step of forming an electrode in a predetermined shape on a substrate; and

a growth step of growing a thermal resistor substance on the electrode.

14. An infrared detection device including a thermal resistance element in which a thermal resistor substance whose resistance changes according to temperature contacts an electrode, the infrared detection device being manufactured by a manufacturing method including:

an electrode formation step of forming the electrode on a semiconductor substrate;

a thin film formation step of forming a thin film on the electrode;

a thin film removal step of removing a portion of the thin film to expose the electrode; and

a growth step of growing the thermal resistor substance

on the exposed electrode.

15. The infrared detection device of claim 13 or 14, wherein the growth step selectively grows the thermal resistor substance on only the electrode by a vapor growth method.

16. The infrared detection device of claim 15, wherein the vapor growth method is a metal-organic chemical vapor deposition method.

17. The infrared detection device of claim 15, wherein the growth step includes:

a vaporization step of vaporizing a composition material of the thermal resistor substance into a gaseous material;

an ion clusterization step of ion clusterizing the gaseous material;

a collection step of collecting the ion clusterized gaseous material on the electrode by giving the electrode a predetermined electric potential to generate an electric field; and

a condensation step of causing the ion clusterized gaseous material to condense on the electrode by heating the electrode to a predetermined temperature, to grow the thermal resistor substance.

18. The infrared detection device of claim 13 or 14, wherein the growth step selectively grows the thermal resistor

substance by a liquid-phase growth method.

19. The infrared detection device of claim 18, wherein the liquid-phase growth method is an electrophoresis method.

20. The infrared detection device of claim 18, wherein the growth step includes:

a colloidization step of colloidizing a composition material of the thermal resistor substance into colloid particles;

a suspension generation step of generating a suspension including the colloid particles;

an electric field generation step of, with the semiconductor substrate being immersed in the suspension, applying a predetermined voltage to the electrode to generate an electric field; and

an aggregation step of causing the colloid particles to aggregate on the electrode by an action of the electric field, to grow the thermal resistor substance.

21. The infrared detection device of claim 13 or 14, wherein a crystal lattice constant of the electrode, along an interface with the thermal resistor substance, is substantially equal to a crystal lattice constant of the thermal resistor substance.

22. The infrared detection device of claim 13 or 14, wherein

a material of the thermal resistor substance is a strongly correlated electron material expressed by a general formula $Pr_xCa_{1-x}MnO_3$, to which a metal oxide, having a perovskite structure that includes an alkaline-earth metal or a rare-earth metal, has been added.

23. The infrared detection device of claim 14, wherein the thin film is an insulation film.

24. The infrared detection device of claim 13 or 14, wherein the thermal resistor substance is a single crystal.